

REMARKS

Claims 1–21 are pending in the application. In the Office action dated February 5, 2010, claims 1–21 were rejected under 35 U.S.C. §§ 102 and 103. Responsive to the Office action, Applicant has amended claims 1 and 12. In view of the above amendments, and the following remarks, Applicant requests reconsideration of the application under 37 C.F.R. § 1.111.

Rejections under 35 U.S.C. § 102

Claims 1–2, 4–7, 11 and 19 are rejected under 35 U.S.C. § 102(b) as being anticipated by Marumoto et al. (JP 08–67535).

The Office action asserts that Marumoto et al. discloses the claimed invention. In particular, that Marumoto et al. discloses "stimulating a reaction at the interface between the glass and the material film resulting in the formation of reaction products at the interface (e.g. by way of thermal treatment or thermal annealing as layer 2 is formed by thermal spray, or coating followed by sintering...)" (Office action at page 2, last para.).

Applicants respectfully suggest that this rejection is inappropriate. In order to reject a claim under 35 U.S.C. § 102 the cited reference must disclose each and every element of the claim, as it is set forth in that claim. Instant claim 1 is directed, in part, to stimulating a chemical reaction at the interface between the glass and the material film resulting in the formation of reaction products at the interface. The Marumoto et al. reference fails to disclose the formation of any reaction products at the interface, stating only that aluminum nickel is sprayed onto the glass substrate, a metal piece is adhered to the resulting coating, and the coating is removed from the substrate (see paras. 0009-00019 and drawing 2 of Marumoto et al.).

Nonetheless, in an effort to further the prosecution of the application, Applicants have amended claim 1 to recite "stimulating a chemical reaction between the glass and the material film resulting in the formation of reaction products at an interface between the glass and the material film such that an interfacial surface of unreacted glass at the interface is textured." Applicants respectfully suggest that Marumoto et al. fail to disclose each and every element of claim 1, as amended, for at least the following reasons.

Marumoto et al. discloses sintering of the glass surface with a coated film specifically in order to increase the adhesive strength between the coating film and the glass surface (see Muromoto et al. at paras. 0014–0015). Applicants suggest that in the context of increasing the adhesive strength between the coated film and glass surface, Marumoto et al. fail to specifically disclose the formation of reaction products as recited in claim 1.

In addition, Marumoto et al. refer to joining the coating and the glass substrate physically, and thereby fail to disclose stimulating a chemical reaction as recited in claim 1, as amended (see para. 0014 of Marumoto et al.).

Furthermore, Marumoto et al. fail to disclose or suggest the formation of reaction products at the interface between the glass the material film such that an interfacial surface of un-reacted glass at the interface is textured, as recited in claim 1, as amended.

In view of the above amendments and remarks, Applicants respectfully suggest that Marumoto et al. fail to disclose each and every element of claim 1, as amended, and therefore request that the rejection of claim 1 under 35 U.S.C. § 102 be withdrawn. As claims 2, 4–7, 11 and 19 depend from claim 1, Applicants similarly request the withdrawal of the rejection of those claims, for at least the same reasons as provided for claim 1.

Claims 1 9–10, 12–18, and 20–21 are rejected under 35 U.S.C. § 102(b) as being anticipated by Shi et al. (WO 00/28602).

The Office action asserts that Shi et al. disclose stimulating a reaction at the interface between the glass and the material film, resulting in the formation of reaction products at the interface, for example by way of BaSO₄ covering the surface of the glass to a significant depth to be etched by HF (Shi et al. page 5, para. 2). Applicants respectfully disagree.

Applicants respectfully suggest that the Shi et al. reference fails to disclose any chemical reaction occurring between the glass and the material film, and fails to disclose the formation of reaction products as recited in claim 1. In contrast, Shi et al. clearly discloses the formation of deposits and/or crystals of applied barium sulfate on the surface of the glass, so that the resulting deposits and/or crystals act as a mask during subsequent etching processes.

As discussed above, amended claim recites "stimulating a chemical reaction between the glass and the material film resulting in the formation of reaction products at an interface between the glass and the material film such that an interfacial surface of un-reacted glass at the interface is textured." Applicants respectfully suggest that the Shi et al. reference fails to disclose or suggest the above features of claim 1, instead disclosing merely a physical masking process via the deposition of barium sulfate deposits/crystals. These crystals create a physical barrier, but do not create a textured interfacial surface at the glass. In short, there is no "reaction" between the glass and the barium sulfate that textures the glass surface of Shi et al.

For at least the reason that Shi et al. fails to disclose each and every element of claim 1, as amended, Applicants suggest claim 1 is not anticipated by the Shi et al. reference, and request the withdrawal of the rejection of claim 1 under 35 U.S.C. § 102. As claims 9–10, 12–18, and 20 depend directly or indirectly from claim 1, Applicants suggest they are similarly not anticipated, for at least the reasons provided for claim 1.

Additionally, and in respect to claim 21, the Office action asserts that Shi et al. discloses a semiconductor film having "an internal absorption efficiency greater than about 0.5 for photons in a wavelength range from about 600 to 1200 nm" because such a property is inherent for silicon semiconductor films. That is, every silicon semiconductor film will inherently display this property. Applicants suggest the action has failed to properly recite and/or consider every element recited in claim 21.

Specifically, claim 21 recites a photovoltaic devices that includes both a glass pane having a textured surface, and a semiconductor film formed on the textured surface of the glass pane (emphasis added). That is, the relevant claim element of claim 21 is not simply that "a semiconductor film" has the recited absorption efficiency, but rather that it is a semiconductor film formed on the textured surface of the glass pane, as positively recited in claim 21, that has the specified internal absorption efficiency.

Applicants therefore suggest that a rejection of claim 1 under 35 U.S.C. § 102 is improper, as simple disclosure of "a semiconductor film" is not sufficient to inherently disclose each and every feature of claim 21. Rather, in order for Shi et al. to anticipate the subject matter of claim 21, the reference must disclose a photovoltaic device that includes a glass pane having a textured surface, a semiconductor film formed on the textured surface of the glass, and having the specified internal absorption efficiency. In other words, the recited

absorption efficiency is not a feature of "a semiconductor film", but a feature of the semiconductor film formed on the textured surface as recited in claim 21.

In addition, with specific reference to Figure 7 of the instant application, the specified absorption efficiency is also not an inherent feature of "any semiconductor film formed on any textured glass pane". Figure 7 shows that neither a semiconductor film formed on a planar glass, nor on a sandblasted (i.e. textured) glass surface "inherently" has the specified absorption efficiency.

In view of the above amendments and remarks, Applicants suggest that the Shi et al. reference fails to anticipate the subject matter of claims 1, 12, and 21 and therefore respectfully request the withdrawal of the rejection of claims 1, 12, and 21 under 35 U.S.C. § 102. As claims 9–10, 13–18, and 20, and 22 depend directly or indirectly from claims 1, 12, and 21, Applicants suggest they are similarly patentable over Shi et al. for at least the same reasons provided for claims 1, 12, and 21.

Rejections under 35 U.S.C. § 103

Claims 3 and 8 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Marumoto et al. (JP 08–67535) as applied to claims 1–2, 4–7, 11 and 19 above, in view of Oboodi et al. (U.S. Patent no. 4,794,048).

The Office action asserts that it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the method of Marumoto et al. by thermally annealing the glass and the material film of metal with a sequence of annealing steps at different temperatures as taught by Oboodi et al., because Oboodi et al. teaches that the thermal annealing process can be carried out in a single step or in

multiple steps, wherein the multiple steps are preferred so that the binding and solvent in the suspension can be removed. Applicants respectfully disagree.

As discussed above with respect to claim 1, The Marumoto et al. reference fails to disclose each and every element of claim 1. The Oboodi et al. reference similarly fails to disclose every element of claim 1, and in particular fails to remedy the deficiencies of the Marumoto et al. reference. The cited references therefore fail to disclose every element of the rejected claims and therefore fail to establish the *prima facie* obviousness of the claims. Applicants therefore request that the rejection of claims 3 and 8 under 35 U.S.C. § 103 be withdrawn.

Summary

In view of the above amendments and arguments, Applicants respectfully suggest that the application is now in condition for allowance. If the Examiner has any questions regarding this paper or the application as a whole, he should contact the undersigned agent so that allowance of the application can be facilitated.

Respectfully submitted,

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